

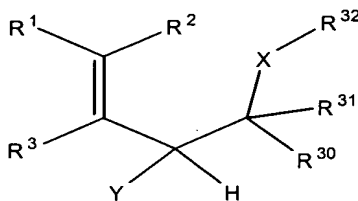
Amendments to the Claims:

The listing of claims set forth below is to replace all prior versions, and listings, of claims in the present application.

Listing of Claims:

Claims 1-27 (canceled)

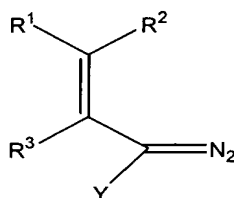
Claim 28 (original) A method of producing a compound having the formula:



where R¹, R², and R³ are independently selected from H, alkyl, aryl, or vinyl or where R¹ and R³, together with the atoms to which they are bonded, form a 5-12 membered ring; Y is an electron withdrawing group; X is CH₂, O, or NR¹¹; R¹¹ is H, an alkyl group, an aryl group, an acyl group, an alkoxycarbonyl group, or a silyl group having the formula -SiR³³R³⁴R³⁵; each of R³⁰ and R³¹ is independently selected from the group consisting of H, alkyl, aryl, and vinyl; R³² is an alkyl group, an aryl group, an acyl group, an alkoxycarbonyl group, or a silyl group having the formula -SiR³⁶R³⁷R³⁸; or R³¹ and R³², together with the atoms to which they are bonded, form a 5-12 membered ring; R³³, R³⁴, R³⁵, R³⁶, R³⁷, and R³⁸ are independently selected

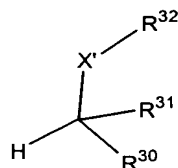
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from an alkyl group and an aryl group; provided that when each of R^{30} and R^{31} is H, X is not CH_2 , said method comprising:
providing a diazo compound having the formula:



and

converting the diazo compound with a compound having the formula:

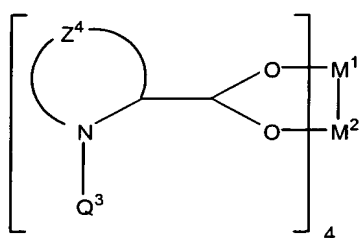


in the presence of a bis-transition metal catalyst and under conditions effective to produce the compound, wherein X' is CH_2 , O, or $NR^{11'}$ and $R^{11'}$ is an alkyl group, an aryl group, an acyl group, an alkoxycarbonyl group, or a silyl group, provided that when X is O or CH_2 , when R^1 and R^3 , together with the atoms to which they are bonded, form a 5-12 membered ring, and when R^{31} and R^{32} , together with the atoms to which they are bonded, form a 5-12 membered ring, said converting is carried out substantially in the absence of oxygen.

Claim 29 (original) A method according to claim 28, wherein the bis-transition metal catalyst is a dirhodium or diruthenium catalyst.

Claim 30 (original) A method according to claim 29, wherein the dirhodium or diruthenium catalyst is a dirhodium or diruthenium tetracarboxylate catalyst.

Claim 31 (original) A method according to claim 30, wherein the dirhodium or diruthenium tetracarboxylate catalyst has the formula:



wherein each of M¹ and M² is Rh or Ru; Z⁴ represents the atoms necessary to complete a 3-12 membered heterocyclic ring; and Q³ is an electron withdrawing group.

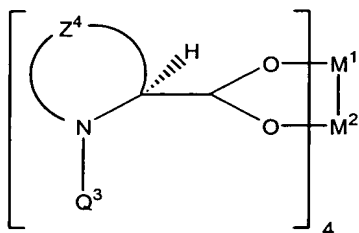
Claim 32 (original) A method according to claim 31, wherein Z⁴ has the formula -CH₂CH₂CH₂-.

Claim 33 (original) A method according to claim 31, wherein Q³ is selected from the group of moieties having the formulae -C(O)R⁹, -SO₂R⁹, and -P(O)R⁹R⁹' and wherein each of R⁹ and R⁹' is independently selected from an alkyl group, an aryl group, and an alkoxy group.

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Claim 34 (original) A method according to claim 33, wherein Q^3 has the formula $-SO_2R^9$ and wherein R^9 is an alkyl or aryl group.

Claim 35 (original) A method according to claim 31, wherein the dirhodium or diruthenium tetracarboxylate catalyst has the formula:



Claim 36 (original) A method according to claim 35, wherein the dirhodium or diruthenium tetracarboxylate catalyst has D_2 symmetry.

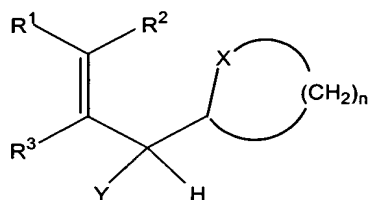
Claims 37-46 (canceled)

Claim 47 (original) A method according to claim 29, wherein the dirhodium or diruthenium catalyst is a chiral dirhodium or diruthenium catalyst.

Claims 48-50 (canceled)

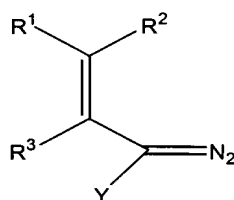
Claim 51 (original) A method according to claim 28, wherein the compound has the formula:

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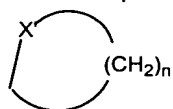
wherein R^1 , R^2 , and R^3 are independently selected from H, alkyl, aryl, or vinyl or where R^1 and R^3 , together with the atoms to which they are bonded, form a 5-12 membered ring; Y is an electron withdrawing group; X is CH_2 , O, or NR^{11} ; R^{11} is H, an alkyl group, an aryl group, an acyl group, an alkoxy carbonyl group, or a silyl group having the formula $-\text{SiR}^{33}\text{R}^{34}\text{R}^{35}$; R^{33} , R^{34} , and R^{35} are independently selected from an alkyl group and an aryl group; and n is 3-10; and wherein said method comprises:

providing a diazo compound having the formula:



and

converting the diazo compound with a cyclic compound having the formula:



in the presence of a bis-transition metal catalyst and under conditions effective to produce the compound, wherein X' is

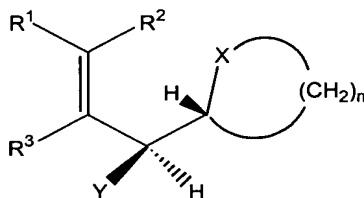
CH_2 , O, or NR^{11} ; R^{11} is an alkyl group, an aryl group, an acyl group, an alkoxy carbonyl group, or a silyl group having the formula $-\text{SiR}^{33}\text{R}^{34}\text{R}^{35}$; and R^{33} , R^{34} , and R^{35} are independently selected from an alkyl group and an aryl group, provided that when X is O or CH_2 and when R^1 and R^3 , together with the atoms to which they are bonded, form a 5-12 membered ring, said converting is carried out substantially in the absence of oxygen.

Claim 52 (original) A method according to claim 51, wherein R^1 and R^3 , together with the atoms to which they are bonded, form a phenyl ring.

Claim 53 (original) A method according to claim 51, wherein Y has the formula $-\text{CO}_2\text{R}^{10}$ and wherein R^{10} is an alkyl or aryl group.

Claim 54 (original) A method according to claim 51, wherein X is NR^{11} and n is 3 or 4.

Claim 55 (original) A method according to claim 51, wherein the compound has the formula:



and wherein the bis-transition metal catalyst is a chiral bis-transition metal catalyst.

Claim 56 (original) A method according to claim 55, wherein X is NR^{11} , n is 3, Y is CO_2R^{12} , R^{12} is alkyl or aryl, and R^1 and R^3 , together with the atoms to which they are bonded, form an aromatic ring.

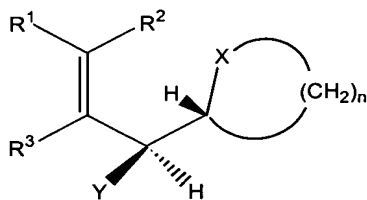
Claim 57 (original) A method according to claim 56, wherein X is NH, R^{12} is a methyl group, and R^1 and R^3 , together with the atoms to which they are bonded, form a phenyl ring.

Claim 58 (original) A method according to claim 51, wherein X is O or CH_2 and wherein said converting is carried out substantially in the absence of oxygen.

Claim 59 (original) A method according to claim 58, wherein said converting is carried out in a degassed solution.

Claim 60 (canceled)

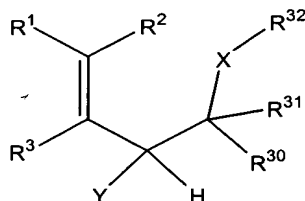
Claim 61 (original) A compound having the formula:



wherein R^1 , R^2 , and R^3 are independently selected from H, alkyl, aryl, or vinyl or where R^1 and R^3 , together with the atoms to which they are bonded, form a 5-12 membered ring; Y is an electron withdrawing group; X is CH_2 , O, or NR^{11} ; R^{11} is H, an alkyl group, an aryl group, an acyl group, an alkoxy carbonyl group, or a silyl group having the formula $-\text{SiR}^{33}\text{R}^{34}\text{R}^{35}$; R^{33} , R^{34} , and R^{35} are independently selected from an alkyl group and an aryl group; and n is 3-10; wherein said compound is produced with a method according to claim 55.

Claims 62-68 (canceled)

Claim 69 (original) A compound having the formula:



wherein R^1 , R^2 , and R^3 are independently selected from H, alkyl, aryl, or vinyl or where R^1 and R^3 , together with the atoms to which they are bonded, form a 5-12 membered ring; Y is an electron withdrawing group; X is CH_2 , O, or NR^{11} ; R^{11} is H, an alkyl group, an aryl group, an acyl group, an alkoxy carbonyl group, or a silyl group having the formula $-\text{SiR}^{33}\text{R}^{34}\text{R}^{35}$; each of R^{30} and R^{31} is independently selected from the group consisting of H, alkyl, aryl, and vinyl; R^{32} is an alkyl group, an aryl group, an acyl group, an alkoxy carbonyl group, or a silyl

group having the formula $-\text{SiR}^{36}\text{R}^{37}\text{R}^{38}$; or R^{31} and R^{32} , together with the atoms to which they are bonded, form a 5-12 membered ring; R^{33} , R^{34} , R^{35} , R^{36} , R^{37} , and R^{38} are independently selected from an alkyl group and an aryl group; provided that when each of R^{30} and R^{31} is H, X is not CH_2 ; and wherein said compound is produced with a method according to claim 28.

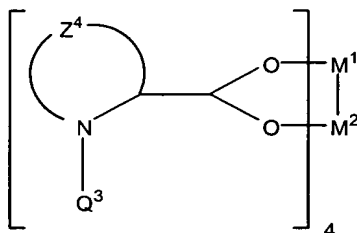
Claims 70-124 (canceled)

Claim 125 (new) A method according to claim 31, wherein each of M^1 and M^2 is Rh.

Claim 126 (new) A method according to claim 51, wherein the bis-transition metal catalyst is a dirhodium or diruthenium catalyst.

Claim 127 (new) A method according to claim 126, wherein the dirhodium or diruthenium catalyst is a dirhodium or diruthenium tetracarboxylate catalyst.

Claim 128 (new) A method according to claim 127, wherein the dirhodium or diruthenium tetracarboxylate catalyst has the formula:



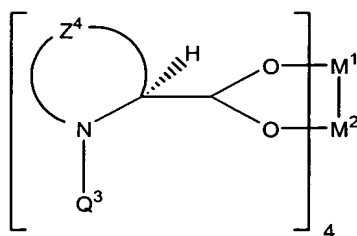
wherein each of M^1 and M^2 is Rh or Ru; Z^4 represents the atoms necessary to complete a 3-12 membered heterocyclic ring; and Q^3 is an electron withdrawing group.

Claim 129 (new) A method according to claim 128, wherein Z^4 has the formula $-\text{CH}_2\text{CH}_2\text{CH}_2-$.

Claim 130 (new) A method according to claim 128, wherein Q^3 is selected from the group of moieties having the formulae $-\text{C}(\text{O})\text{R}^9$, $-\text{SO}_2\text{R}^9$, and $-\text{P}(\text{O})\text{R}^9\text{R}^{9'}$ and wherein each of R^9 and $\text{R}^{9'}$ is independently selected from an alkyl group, an aryl group, and an alkoxy group.

Claim 131 (new) A method according to claim 130, wherein Q^3 has the formula $-\text{SO}_2\text{R}^9$ and wherein R^9 is an alkyl or aryl group.

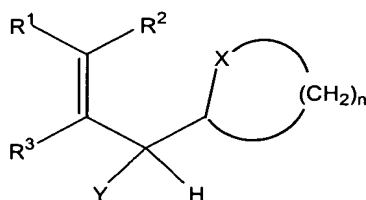
Claim 132 (new) A method according to claim 128, wherein the dirhodium or diruthenium tetracarboxylate catalyst has the formula:



Claim 133 (new) A method according to claim 132, wherein the dirhodium or diruthenium tetracarboxylate catalyst has D_2 symmetry.

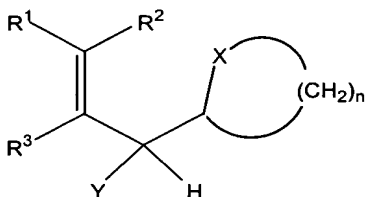
Claim 134 (new) A method according to claim 128, wherein each of M^1 and M^2 is Rh.

Claim 135 (new) A compound having the formula:



wherein R^1 , R^2 , and R^3 are independently selected from H, alkyl, aryl, or vinyl or where R^1 and R^3 , together with the atoms to which they are bonded, form a 5-12 membered ring; Y is an electron withdrawing group; X is CH_2 , O, or NR^{11} ; R^{11} is H, an alkyl group, an aryl group, an acyl group, an alkoxy carbonyl group, or a silyl group having the formula - $SiR^{33}R^{34}R^{35}$; R^{33} , R^{34} , and R^{35} are independently selected from an alkyl group and an aryl group; and n is 3-10; and wherein said compound is produced with a method according to claim 51.

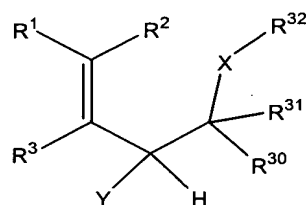
Claim 136 (new) A compound having the formula:



wherein R^1 , R^2 , and R^3 are independently selected from H, alkyl, aryl, or vinyl or where R^1 and R^3 , together with the atoms to which they are bonded, form a 5-12 membered ring; Y is an electron withdrawing group; X is CH_2 , O, or NR^{11} ; R^{11} is

H, an alkyl group, an aryl group, an acyl group, an alkoxy carbonyl group, or a silyl group having the formula -SiR³³R³⁴R³⁵; R³³, R³⁴, and R³⁵ are independently selected from an alkyl group and an aryl group; and n is 3-10; and wherein said compound is produced with a method according to claim 128.

Claim 137 (new) A compound having the formula:



wherein R¹, R², and R³ are independently selected from H, alkyl, aryl, or vinyl or where R¹ and R³, together with the atoms to which they are bonded, form a 5-12 membered ring; Y is an electron withdrawing group; X is CH₂, O, or NR¹¹; R¹¹ is H, an alkyl group, an aryl group, an acyl group, an alkoxy carbonyl group, or a silyl group having the formula -SiR³³R³⁴R³⁵; each of R³⁰ and R³¹ is independently selected from the group consisting of H, alkyl, aryl, and vinyl; R³² is an alkyl group, an aryl group, an acyl group, an alkoxy carbonyl group, or a silyl group having the formula -SiR³⁶R³⁷R³⁸; or R³¹ and R³², together with the atoms to which they are bonded, form a 5-12 membered ring; R³³, R³⁴, R³⁵, R³⁶, R³⁷, and R³⁸ are independently selected from an alkyl group and an aryl group; provided that when each of R³⁰ and R³¹ is H, X is not CH₂; and wherein said compound is produced with a method according to claim 31.